Linking Online Procrastination to Online Shopping Cart Abandonment : A Multi-Group Analysis from India and Ethiopia

Piyusa Das [1]
Bhuwandeep [2]

Abstract

Purpose : The effect of shopping procrastination, defined as a deliberate and chronic delay in action, on shopping cart abandonment behavior remains unexplored. The primary objective of this study was to examine the relationship between online procrastination (OP) and shopping cart abandonment (OSCA).

Methodology : An online structured questionnaire was floated, and responses ($n = 327$) were collected from online shoppers of two countries (India and Ethiopia). Analysis of variance (ANOVA) using IBM SPSS 25.0 and structural equation modeling (SEM) using IBM AMOS 23.0 were carried out.

Findings : We observed mean level differences for OP and OSCA across annual income groups, number of sites used for online shopping, and frequency. The structural equation modeling results revealed a significant positive relationship (β=0.57, Adjusted R-Square=0.33) between OP and OSCA. Also, the multi-group analysis revealed that monthly spending levels for online shopping moderated the relationship between OP and OSCA.

Practical Implications : By identifying the specific procrastination tendencies and their impact on cart abandonment, we contributed to understanding consumer behavior in online shopping contexts and provided actionable recommendations for reducing cart abandonment rates.

Originality : Although the previous studies covered a broader range of factors, a specific examination of the direct link between procrastination tendencies and cart abandonment was lacking in the existing literature. Therefore, the current study addressed this research gap by investigating the unique contribution of online shopping procrastination to cart abandonment, providing a more comprehensive understanding of this phenomenon.

Keywords : online procrastination, online shopping cart abandonment, structural equation modeling, multi-group analysis

Paper Submission Date : September 25, 2022 ; Paper sent back for Revision : May 18, 2023 ; Paper Acceptance Date : June 15, 2023 ; Paper Published Online : October 15, 2023

Online shopping has grown tremendously in recent years, revolutionizing how people purchase. However, alongside this growth, the issue of shopping cart abandonment has emerged as a significant challenge for e-commerce businesses. Shopping cart abandonment is when customers add items to their carts but ultimately decide not to finalize the purchase. Based on 41 studies (Baymard Institute, 2019), the average online shopping cart abandonment (OSCA) rate was 69.57%, meaning many potential sales are left uncompleted, resulting in significant revenue loss. Online retailers are particularly interested in reducing this possible loss of revenue since 70% of online shoppers have confessed to cart abandonment (Rubin et al., 2020).

[1] *Associate Professor - Analytics & Marketing (Corresponding Author),* KIIT School of Management (KIIT University), Bhubaneswar - 751 024, Odisha. (Email : piyusa.das@gmail.com) ; ORCID iD : https://orcid.org/0000-0002-7027-9452
[2] *Assistant Professor - Analytics & Marketing,* KIIT School of Management (KIIT University), Bhubaneswar - 751 024, Odisha. (Email : bhuwandeep@ksom.ac.in) ; ORCID iD : https://orcid.org/0000-0002-4057-6026

Moreover, one abandons the cart for every five online shoppers, signifying significant potential loss (Pappas et al., 2016). As a result, customers leaving their shopping carts can pose a significant financial challenge for e-commerce businesses. Online shopping abandonment costs around $3 billion to e-commerce companies (Taheer, 2023). Therefore, companies actively seek strategies to reduce cart abandonment and maximize conversion rates. Consequently, it is vital to comprehend why customers abandon shopping carts so that effective measures can be taken to reduce it and improve the overall online shopping experience.

Researchers have analyzed different factors that contribute to OSCA, including concerns about not being able to physically examine products and uncertainty around the delivery and return processes (Cho, 2004); informational needs (Cho et al., 2006); perceived waiting time, risk, and transaction inconvenience (Rajamma et al., 2009); entertainment value; cart as a research and informational tool; cost concerns; waiting for a sale; privacy and security concerns (Close & Kukar-Kinney, 2010; Kukar-Kinney & Timothy, 2012); perceived risk and ownership (Egeln & Joseph, 2012); trust in the payment mechanism (De Silva & Wijayanayake, 2015); perceived risk and mental accounting & budgeting (Sondhi, 2017); perceived risk, transaction risk, shopping for entertainment purpose (Erdil, 2018); motivation for shopping activities and product categorization variables (Song, 2019); and consumer mindset (Rubin et al., 2020).

Previous research has identified various factors influencing shopping cart abandonment, including high shipping costs, complicated checkout processes, and concerns about payment security. However, one crucial aspect that remains relatively unexplored is the role of online shopping procrastination in contributing to cart abandonment. Online shopping procrastination refers to the tendency of individuals to delay their purchase decisions while shopping online, leading to prolonged browsing and hesitation in finalizing the transaction. Thus, our study intends to study the connection between online procrastination (OP) and OSCA behavior. Furthermore, the moderating effect of several customer variables (country of residence, gender, age, annual income, monthly online shopping spend amount, number of online shopping sites utilized, and frequency of online shopping) is investigated.

Additional research is undoubtedly needed on OSCA, as the overall number of studies directly focused on OSCA is minimal (Mittal, 2022). During COVID-19, e-commerce increased, but so did shopping cart abandonment, resulting in lost online retail sales (Ong et al., 2022). Furthermore, there is a significant knowledge gap in OSCA studies in poor and undeveloped countries because most OSCA studies are published in the United States and China (Wang et al., 2023). By conducting a comprehensive quantitative survey across two countries (India and Ethiopia), we will gain insights into the reasons behind OSCA and the specific role of OP in this behavior. Through our research, we aim to provide valuable insights and practical recommendations for e-commerce businesses to optimize their online platforms, improve conversion rates, and mitigate the negative impact of shopping cart abandonment.

Literature Review

The literature review provides a comprehensive overview of recent studies relevant to the research problem of exploring OP and OSCA. In addition, the review highlights the research gap and the significance of the current study.

Shopping Procrastination

Procrastination is an unnecessary or irrational task delay (Steel, 2007). Procrastination is further classified as functional and dysfunctional (Chun Chu & Choi, 2005; Darpy, 2000). The likelihood of success can be maximized by using functional procrastination as a valid delaying strategy when there is excessive risk or danger (Corkin et

al., 2011; Ferrari, 1994). In online shopping, procrastination can be functional (Negra et al., 2008). The link between the procrastination tendency of individuals and shopping behavior has been established in an earlier study (Zanjani et al., 2016). When consumers procrastinate, they may become angry and blame the company instead of taking responsibility for their actions, leading to retaliatory behaviors like complaining and leaving (Azimi et al., 2020).

Online Shopping Cart Abandonment

Different consumers have different reasons for online shopping abandonment. Security and privacy risks are the main concerns in customers' perceptions (Zhou & Gao, 2014). The shopping process and how products are organized and researched within the cart can significantly affect cart abandonment rates (Xu & Huang, 2015). If consumers doubt the product quality or slow checkout at the website during online shopping, they may abandon the process altogether (Manne et al., 2017). In addition, consumers are more likely to give up on their preliminary choice if they have to choose from a set where only the initial option is missing information (Irmak et al., 2017). The functional relationship between shopping stress and purchase abandonment is monotonic and positive for task-oriented consumers, whereas for recreation-oriented consumers, it is an inverted U-shape (Albrecht et al., 2017). According to a customer segmentation study, the high Shopping Cart Abandonment customer group also exhibited considerable cognitive dissonance due to the mental budgeting they considered for the product/category (Sondhi, 2017). The top two reasons for cart abandonment are financial considerations and using the cart as an organizing tool (Rochanapon et al., 2021). According to a recent study (Wang et al., 2022), waiting for lower prices can cause hesitation during checkout, leading to cart abandonment or shopping in a physical store. A study (Benson & Ndoro, 2022) from South Africa reiterated that the likelihood of abandoning an online shopping cart is influenced by factors such as concerns about security, costs, and the level of organization and research provided by the website.

According to a study on mobile shopping cart abandonment, hesitant shoppers are less inclined to abandon their carts if they are satisfied with the purchasing experience (Huang et al., 2018). The likelihood of abandonment is greatly affected by the risks involved in the transaction and the item being purchased (Rodrigues et al., 2022). Adding more items to their basket makes existing customers less likely to complete a purchase, while new customers tend to abandon their cart as they browse more pages (Rausch & Brand, 2022). Research on clickstream data revealed that cart abandoners are usually new or mobile customers (Rausch et al., 2022).

In summary, the existing literature on online shopping behavior has acknowledged various factors contributing to shopping cart abandonment, but the specific role of online shopping procrastination remains relatively unexplored. Recent studies have touched upon related aspects such as decision-making procrastination and factors influencing cart abandonment. Still, a comprehensive examination of the relationship between online shopping procrastination and cart abandonment is lacking. The present study addresses this research gap by rigorously investigating the influence of online shopping procrastination on cart abandonment, thereby contributing to understanding consumer behavior in e-commerce and providing practical implications for businesses to reduce cart abandonment rates. Understanding procrastination is critical for e-commerce organizations, given the increasing popularity of online purchasing and the financial impact of shopping cart abandonment.

Conceptual Framework and Hypotheses

The current study on the relationship between online shopping procrastination and shopping cart abandonment relates to the stimulus-organism-response (S-O-R) theory. The S-O-R theory posits that external stimuli (S) elicit

internal cognitive and affective processes (O), which, in turn, lead to behavioral responses (R). In the context of online shopping, stimuli such as website design, product information, and promotions influence consumers' internal processes, which ultimately shape their online shopping behavior. In this study, online shopping procrastination can be seen as an internal cognitive process (O) influenced by various stimuli (S) in the online shopping environment. Factors like website layout, navigation intricacy, and diversions may contribute to consumers' procrastination when purchasing online. These inputs might cause cognitive dissonance, difficulty making decisions, or distractions, resulting in postponed purchases and shopping cart abandonment.

Conceptual Framework

We propose a new (B-C-D-E) framework to provide a conceptual understanding and categorize different stages of online shopping abandonment. It identifies four key stages: browsing abandonment, cart abandonment, deal (transaction) abandonment, and end page abandonment. By delineating these stages, the framework offers a systematic approach to analyzing and addressing the complex phenomenon of online shopping abandonment.

Browsing Abandonment

Browsing abandonment is when a potential customer visits an online store or website but leaves without engaging in any further action. This stage involves the initial exploration and evaluation of products or services offered. Factors such as website design, navigation ease, product presentation, and information availability are crucial in determining whether a user proceeds to the next stage or abandons the browsing process.

Cart Abandonment

When a consumer adds things to their online shopping basket but does not finish the purchase, this is known as cart abandonment. This stage reflects consumers' decision-making process as they deliberate on the final purchase. Factors such as unexpected costs, complicated checkout processes, security concerns, and comparison shopping can contribute to cart abandonment. Understanding the reasons behind cart abandonment is essential for improving conversion rates and optimizing the online shopping experience.

Deal (Transaction) Abandonment

Deal abandonment is when a customer initiates the transaction process but fails to complete it. This stage involves crucial actions such as entering payment details, confirming the order, and finalizing the purchase. Factors such as technical issues, payment system errors, lengthy forms, and lack of trust can contribute to deal abandonment. Therefore, streamlining the transaction process and building trust are vital to reducing deal abandonment.

End Page Abandonment

End page abandonment is when a user leaves the website or online store immediately after completing the transaction. This stage occurs after the deal is finalized and the customer exits the website or receives a confirmation page. Factors such as slow loading times, lack of post-purchase support, unappealing thank-you pages, or a cumbersome return process can contribute to end-page abandonment. Ensuring a seamless post-purchase experience is crucial for customer satisfaction and fostering long-term relationships.

Measures

Based on the B-C-D-E framework discussed in the previous section, we have modified the online cart abandonment scale (Close & Kukar-Kinney, 2010). We adopted the online procrastination scale (Negra & Nabil Mzoughi, 2012), which has two factors: Online deal proneness (ODP) with two items and online rationality (OR) with three items.

A few experts reviewed the instruments to check for content adequacy, completeness, and accuracy. In addition to the items in Table 1, questions are asked on the consumer demographic parameters depicted in Figure 1 (country of residence, gender, age, annual income, monthly online shopping spend amount, number of online shopping sites utilized, and frequency of online shopping).

Hypotheses

Shopping cart abandonment varies across countries (Serrano, 2020). Studies also have found that procrastination varies across cultures and countries (Svartdal et al., 2016). For our study purpose, we have selected two countries at both ends of the spectrum of Internet users: India, with Internet users of 560 million (Kemp, 2019), and Ethiopia, with 21 million Internet users (Kemp, 2020). Based on the above grouping characteristics, we anticipate a considerable variation in mean online procrastination and shopping cart abandonment levels. As a result, the first set of hypotheses is as follows:

✤ **$H1_0$:** The mean levels of "OP" and "OSCA" do not vary significantly across countries.

✤ **$H1_a$:** The mean levels of "OP" and "OSCA" vary significantly across countries.

In addition, procrastination traits have been compared and contrasted between males and females (Zhou, 2020). For example, males are more likely not to abandon shopping carts (Arora et al., 2016).

Table 1. *Measures for OSCA and OP*

Constructs	Items
OSCA	*Browsing abandonment (BA):* "How often do you leave the website without adding product(s) into the cart, even though you had intended to buy the product(s)?"
	Cart abandonment (CA): "How often do you add product(s) in your online shopping cart but leave the website without going to the transaction page?"
	Deal (transaction) abandonment (DA): "After adding product(s) into your online shopping cart, how often do you leave the website from the transaction (shipping, payment options, etc.) page without making any purchase?"
	End page (order) abandonment (EA): "After adding product(s) into your online shopping cart, how often do you leave the website on the final order confirmation page without making any purchase?"
OP	*ODP1:* "When I intend to buy things over the Internet, I voluntarily delay the purchase."
	ODP2: "I occasionally postpone an internet buy to optimize my chances of getting the greatest offer."
	OR1: "When shopping online, I delay the purchase to get more information voluntarily."
	OR2: "When I intend to buy things over the Internet, I spend a lot of time comparing websites and shops."
	OR3: "I spend a lot of time searching for additional information to make an online purchase decision."

Note. The OSCA Scale (Kukar-Kinney & Close, 2010) is a 7 - point scale (*1: Never to 7: Always*), and the OP Scale (Negra & Nabil Mzoughi, 2012) is also a 7-point scale (*1: Strongly disagree to 7: Strongly Agree*).

✤ **H2₀ :** The mean levels of "OP" and "OSCA" vary significantly across genders.

✤ **H2ₐ :** The mean levels of "OP" and "OSCA" vary significantly across genders.

However, there is almost no existing literature on determining online procrastination and shopping cart abandonment across various age groups and income groups. Therefore, we have considered three age (in years) groups (up to 24, between 24 and 34, and above 34).

✤ **H3₀ :** The mean levels of "OP" and "OSCA" vary significantly across ages.

✤ **H3ₐ :** The mean levels of "OP" and "OSCA" vary significantly across ages.

For this study, we have considered three annual income groups (Less than $ 6,500, between $ 6,500 and $ 13,000, and above $ 13,000).

✤ **H4₀ :** The mean levels of "OP" and "OSCA" vary significantly across annual income.

✤ **H4ₐ :** The mean levels of "OP" and "OSCA" vary significantly across annual income.

Additionally, we expect significant differences in mean levels of OP and OSCA across different online shopping characteristics, such as spending amount on online shopping, number of online sites used for shopping, and frequency of purchase. The average order value in online shopping is around $ 128 (Ogonowski, 2020). Hence, we considered three levels of average online spending per month (Less than $ 130, between $ 130 and $ 260, and more than $ 260).

✤ **H5₀ :** The mean levels of "OP" and "OSCA" do not vary significantly across monthly spending in online shopping.

✤ **H5ₐ :** The mean levels of "OP" and "OSCA" vary significantly across monthly spending in online shopping.

Furthermore, approximately 62% of online buyers shop once a month, whereas 26% shop once weekly (Fox, 2023). Hence, we considered three levels for purchase frequency in a month (less than three times, between three and five times, and more than five times).

✤ **H6₀ :** The mean levels of "OP" and "OSCA" do not vary significantly across the number of sites used for online shopping.

✤ **H6ₐ :** The mean levels of "OP" and "OSCA" vary significantly across the number of sites used for online shopping.

Similarly, we have considered three levels of the number of different sites customers use for online shopping (less than 3, between 3 and 5, and more than 5).

✤ **H7₀ :** The mean levels of "OP" and "OSCA" do not vary significantly across the frequency (in a month) of online shopping.

✤ **H7ₐ :** The mean levels of "OP" and "OSCA" vary significantly across the frequency (in a month) of online shopping.

Based on the conceptual model shown in Figure 1, we hypothesize that the positive relationship between OP

Figure 1. *Conceptual Model Linking OP and OSCA*
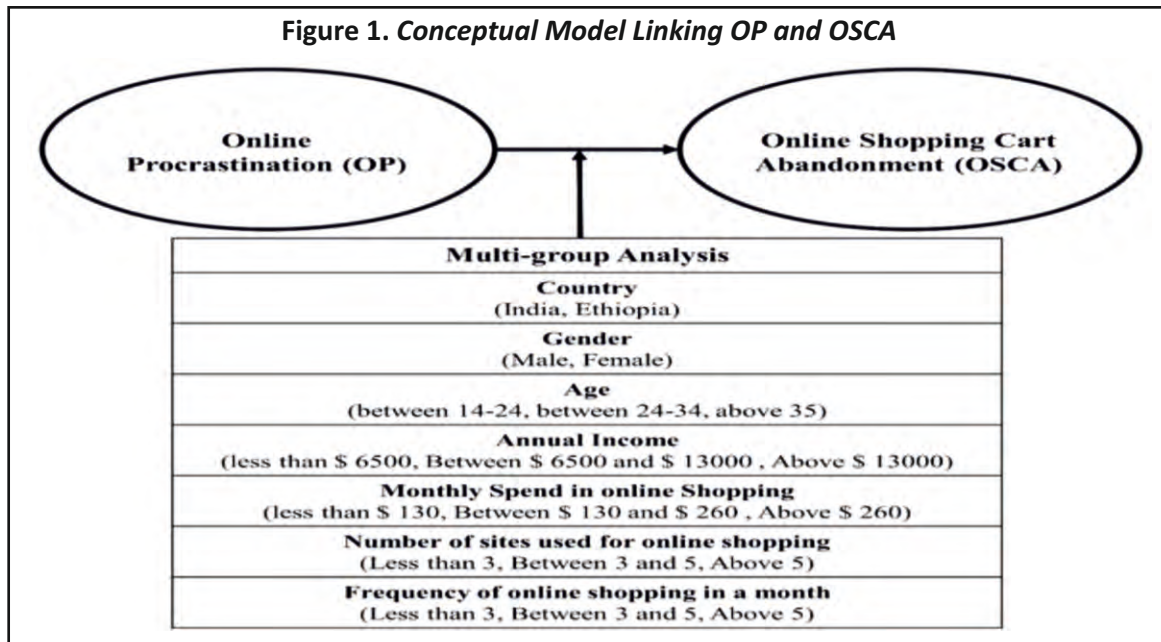
and OSCA will be moderated by various customer characteristics (country of residence, gender, age, annual income, monthly online shopping spend amount, number of online shopping sites used, and frequency of online shopping).

The hypotheses for the moderating effect of "Country of Residence" are as follows:

↳ **H8₀ :** The positive relationship between "OP" and "OSCA" is not moderated by country of residence.

↳ **H8ₐ :** The positive relationship between "OP" and "OSCA" is moderated by country of residence.

The hypotheses for the moderating effect of "Gender" are as follows:

↳ **H9₀ :** The positive relationship between "OP" and "OSCA" is not moderated by gender.

↳ **H9ₐ :** The positive relationship between "OP" and "OSCA" is moderated by gender.

The hypotheses for the moderating effect of "Age" are as follows:

↳ **H10₀ :** The positive relationship between "OP" and "OSCA" is not moderated by age.

↳ **H10ₐ :** The positive relationship between "OP" and "OSCA" is moderated by age.

The hypotheses for the moderating effect of "Annual Income" are as follows:

↳ **H11₀ :** Annual income does not moderate the positive relationship between "OP" and "OSCA."

↳ **H11ₐ :** Annual income moderates the positive relationship between "OP" and "OSCA."

The hypotheses for the moderating effect of monthly spending on online shopping are as follows:

↳ **H12₀ :** Monthly spending on online shopping does not moderate the positive relationship between "OP" and "OSCA."

✤ **H12_a :** Monthly spending on online shopping moderates the positive relationship between "OP" and "OSCA."
The hypotheses for the moderating effect of the number of sites used for online shopping are as follows:

✤ **H13_0:** The positive relationship between "OP" and "OSCA" is moderated by the number of sites used for online shopping.

✤ **H13_a :** The positive relationship between "OP" and "OSCA" is moderated by the number of sites used for online shopping.

The hypotheses for the moderating effect of "Online shopping frequency" are as follows:

✤ **H14_0 :** The positive relationship between "OP" and "OSCA" is moderated by online shopping frequency (in a month).

✤ **H14_a :** The positive relationship between "OP" and "OSCA" is moderated by online shopping frequency (in a month).

Methodology

An online structured questionnaire was used as the primary data collection tool. The online survey method was chosen due to its convenience and broad reach to online shoppers from different locations. The sampling frame consisted of online shoppers from India and Ethiopia. The target countries of India and Ethiopia were chosen due to their varied socio-cultural backgrounds and representation of diverse Internet retail markets. This approach allows for a broader understanding of the relationship between OP and OSCA in different cultural contexts. The questionnaire gathered information about online shopping procrastination, shopping cart abandonment, and relevant demographic variables. The study was conducted in May–June 2020.

The individual online shoppers constituted the sampling units. Three hundred twenty-seven respondents participated in the study, providing a sufficient sample size for statistical analysis. The scales used in the questionnaire to measure online shopping procrastination and shopping cart abandonment were derived from existing literature. The reliability of the scales was assessed using standard measures, such as Cronbach's alpha, to ensure the internal consistency of the items. In addition, information regarding their demographic characteristics, such as age, gender, educational background, and online shopping experience, was collected to understand the sample comprehensively.

The collected data were analyzed using IBM SPSS 25.0 and IBM AMOS 23.0 software packages. Analysis of variance (ANOVA) was employed to examine the differences in online shopping procrastination and cart abandonment across various factors. In addition, structural equation modeling (SEM) was used to assess the relationships between online shopping procrastination and shopping cart abandonment.

Data Collection & Screening

Responses were collected from Indian and Ethiopian shoppers through an online survey administered for one month. We received 283 responses from Indian online shoppers and 89 responses from Ethiopian online shoppers. After removing missing data (<10% of total responses), 341 responses (259 responses from India and 82 responses from Ethiopia) were considered in the analysis. Fourteen Indian respondents provided careless/insufficient effort responses (Curran, 2016), i.e., they provided the same responses for all the questions. Therefore, we did not consider those 14 responses for further analysis. This yielded a dataset with 327 responses for further consideration. A total of 60.6% of the respondents were male, and 39.4% were female; 53.2% of the

respondents were between 18 and 24, 28.7% were between ages 25 and 34, and the rest 18.1% were above 35 years of age; 48.9% of the respondents had an annual income of less than $ 6,500, 29.1% were within the annual income range of $ 6,501 to $ 13,000, and the remaining 22% were in the annual income group of above $ 13,000; 53.5% of the respondents spent less than $ 130 per year on online purchases, 27.8% spent between $ 130 to $ 260 per year, and 18.7% spent more than $ 260 on online purchases; 39.1% of the respondents used less than three online shopping sites, 43.7% used between three to five online sites, and 17.1% used more than five online sites in a year for shopping; 57.2% of the respondents had an online purchase frequency of fewer than three times a month, 28.4% had an online purchase frequency of three to five times a month, and 14.4% did online shopping more than five times a month.

Analysis and Results

An exploratory factor analysis (EFA) was carried out with the maximum likelihood extraction method (same algorithm as AMOS), with Promax rotation and suppressing small coefficients (0.3). One of the items (ODP 1) was removed from the analysis as the factor loading was less than 0.5. (Matsunaga, 2010). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity gave significant results for further investigation. As per the pattern matrix, the items were loaded into two factors per the proposed theoretical model showing face validity. The loadings of items were more significant than 0.5, establishing convergent validity. The correlation between factors was less than 0.5, showing discriminant validity. Cronbach's alpha was more significant than the acceptable level of 0.7, which offers the reliability of the scales. The details of factor loading with reliability scores are shown in Table 2.

Harman's single-factor test (Harman, 1967) was carried out, and the variance extracted by a single factor was 40.3%, which is less than the limit of 50%. Hence, the threat of common method bias (CMB) was ruled out.

**Table 2.** *Factor Loadings with Nine Items and Eight Items*

	Rotated Factor Matrix (with nine items) (KMO Measure of Sampling Adequacy: 0.815, Factor Correlation: 0.429)		Rotated Factor Matrix (with eight items) (KMO Measure of Sampling Adequacy: 0.793, Factor Correlation: 0.395)	
	Factor 1	Factor 2	Factor 1	Factor 2
	0.795	0.797	0.797	0.783
	(Cronbach's Alpha)	(Cronbach's Alpha)	(Cronbach's Alpha)	(Cronbach's Alpha)
ODP1	0.472		Item removed	
ODP2	0.599			0.543
OR2	0.744			0.639
OR3	0.695			0.820
OR1	0.682			0.739
BA		0.605	0.604	
CA		0.670	0.668	
DA		0.750	0.778	
EA		0.715	0.747	

Note. Online deal proneness *(ODP)*, Online rationality *(OR)*, Browsing abandonment *(BA)*, Cart abandonment *(CA)*, Deal abandonment *(DA)*, End page abandonment *(EA)*.

Measurement Model Evaluation

The measurement model is evaluated based on the indexes' minimum discrepancy (CMIN/*DF*) <3.0, comparative fit index (CFI) > 0.96, root mean square error of approximation (RMSEA) < 0.07, and standardized root mean square residual (SRMR) < 0.08 (Hair et al., 2019; Hooper et al., 2008; Sharma et al., 2005). The model resulted in CMIN/*DF*: 3.344, CFI: 0.945, RMSEA: 0.085, and SRMR: 0.0524. Hence, we modified the model by covarying error terms within the same construct (for modification indices> 10), resulting in CMIN/*DF*: 1.459, CFI: 0.99, RMSEA: 0.038, SRMR: 0.0340.

The composite reliability for OSCA is 0.77, and OP is 0.80, greater than the cutoff value of 0.7. The average variance extracted (AVE) worked out to be OSCA (0.46) and OP (0.51), establishing convergent validity. As the square root of AVE is greater than the inter-construct correlations (0.452), and maximum shared variance (MSV) and average shared variance (ASV) are less than AVE, the scales have discriminant validity too. The measurement models (initial and modified) are shown in Figure 2. We performed a configural invariance test on the freely estimated model and discovered it was invariant in different groups, as shown in Table 3.

Figure 2. *Measurement Model*
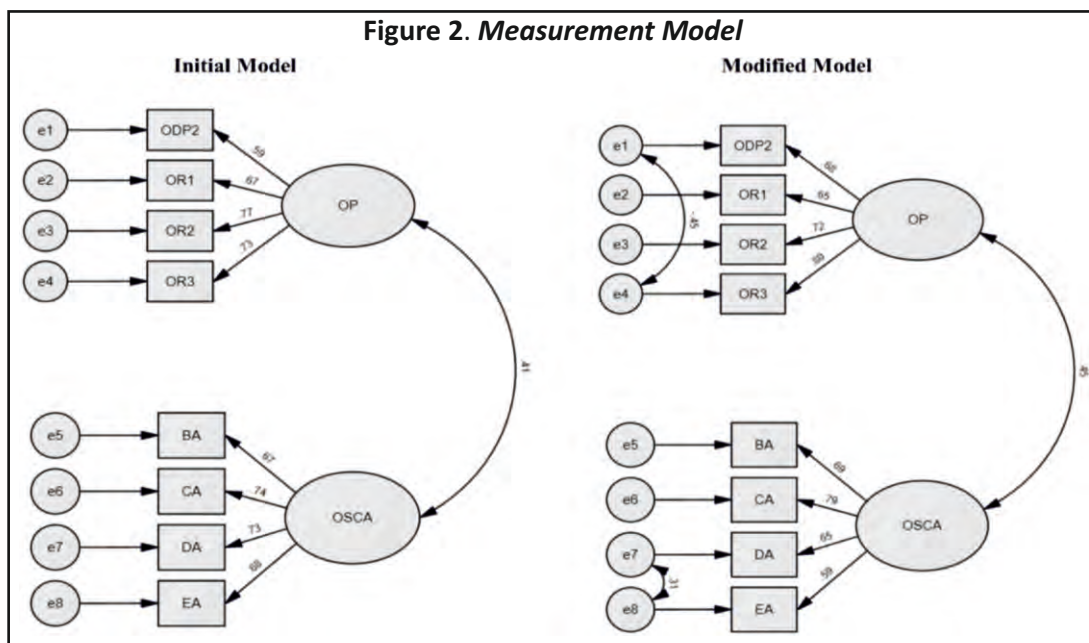
Table 3. *Invariance Test*

	Invariance Test (Fit Indices)			
	PCMIN/*DF*	**CFI**	**RMSEA**	**SRMR**
Country	1.387	0.984	0.034	0.0441
Gender	1.513	0.979	0.040	0.0418
Age group	2.057	0.940	0.057	0.0540
Annual income	1.656	0.960	0.045	0.0468
Monthly spending in online shopping	1.204	0.987	0.025	0.0371
Number of sites used for online shopping	1.780	0.953	0.049	0.0433
Frequency of online shopping in a month	1.295	0.982	0.030	0.0464

Structural Model

We utilize Cook's D (Aguinis et al., 2013; Cook, 1977) measures to find and remove the dataset's five influential (more than three standard deviations from mean distance) observations before the structural model fit. As seen in Table 4, OP has a considerable impact on OSCA.

Multivariate Analysis

We analyze the variance to examine the mean level difference in "OP" and "OSCA" to test hypotheses 1–7. The results support the hypotheses for mean level differences for OP and OSCA across annual income groups (H4), the number of sites used for online shopping (H6), and the frequency of online shopping (H7). However, the results fail to support the hypotheses for mean level differences for OP and OSCA across countries (H1), gender (H2), age (H3), and monthly online spending (H5). The results of the analysis are provided in Table 5.

Table 4. Regression Coefficient and Adjusted R-Square for the Model

		Independent Variable : OP, Dependent Variable : OSCA						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**			**Collinearity Statistics**	
		B	**Std. Error**	**Beta**	**t**	**Sig.**	**Tolerance**	**VIF**
1	(Constant)	1.038	0.172		6.046	0.000		
	OP	0.437	0.035	**0.574**	12.548	0.000	1.000	1.000

Adjusted R-Square : 0.328.

Table 5. Multivariate Analysis for the Difference in Mean Levels

Hypothesis	Mean Levels (of groups)			F-statistics (Wilk's Lambda) and Significance	Result
H1		OP	OSCA	$F = 1.829$, $p = 0.162$	H1$_a$ not accepted
(Country)	India	4.84	3.15	Partial Eta Squared: 0.01	
	Ethiopia	4.54	3.03		
H2		OP	OSCA	$F = 0.026$, $p = 0.974$	H2$_a$ not accepted
(Gender)	Male	4.77	3.11	Partial Eta Squared: 0.00	
	Female	4.76	3.13		
H3		OP	OSCA	$F = 1.035$, $p = 0.388$	H3$_a$ not accepted
(Age)	Up to 24	4.80	3.12	Partial Eta Squared: 0.00	
	Between 24 and 34	4.89	3.17		
	Above 34	4.49	3.04		
H4		OP	OSCA	$F = 2.856$, $p = 0.023$	H4$_a$ accepted*
(Annual	Less than $ 6,500	4.83	3.24	Partial Eta Squared: 0.018	
Income)	Between $ 6,500 and $ 13,000	4.78	3.14		
	Above $ 13,000	4.62	2.80		
H5		OP	OSCA	$F = 0.743$, $p = 0.563$	H5$_a$ not accepted
(Monthly	Less than $ 130	4.71	3.11	Partial Eta Squared: 0.05	

		OP	OSCA		
Spending	Between $ 130 and $ 260	4.81	3.19		
on Online	Above $ 260	4.86	3.03		
Shopping)					
H6		*OP*	*OSCA*	F = 2.723, p = 0.029	H6$_a$ accepted*
(Number	Less than 3	4.63	3.16	Partial Eta Squared: 0.017	
of Sites Used	Between 3 and 5	4.77	3.11		
for Online	Above 5	5.05	3.03		
Shopping)					
H7		*OP*	*OSCA*	F = 2.476, p = 0.043	H7$_a$ accepted*
(Frequency of	Less than 3	4.83	3.19	Partial Eta Squared: 0.015	
Online	Between 3 and 5	4.57	3.07		
Shopping)	Above 5	4.92	2.92		

Note. *p < 0.05.

Our analysis finds significant variations in the mean levels of OP and OSCA across annual income, the number of sites used for online shopping, the frequency of online shopping, and monthly spending. These suggest that these variables may substantially predict our study population's online shopping procrastination and cart abandonment.

Our findings indicate no significant variations in the mean levels of online procrastination and shopping cart abandonment across the two countries, India and Ethiopia. This might be due to the democratic nature of online shopping platforms where individual and cultural differences dissolve. Our analysis does not reveal significant variations in the mean levels of OP and OSCA across genders, age groups, and monthly spending on online shopping. However, it is crucial to consider that contextual factors specific to our study population might have influenced these results.

Multi-Group Analysis

We used a multi-group analysis to investigate the difference in path coefficients to test the moderation effect (hypotheses 8–14) between "OP" and "OSCA." Based on the results shown in Table 6, H12 is only supported, i.e., the positive relationship between "OP" and "OSCA" is moderated by monthly spending in online shopping.

Table 6. *Multi-Group Analysis*

Hypotheses		Path Coefficients (β) (*OP $\rightarrow$ OSCA*)	The critical ratio for the difference in parameter & *p*-value for nested model comparison	Result
H8	India (Group 1)	0.60	Group 1 - Group 2: – 0.533	H8$_a$ not accepted
(Country)	Ethiopia (Group 2)	0.46	*p*-value = 0.595	
H9	Male (Group 1)	0.572	Group 1 - Group 2: – 0.158	H9$_a$ not accepted
(Gender)	Female (Group 2)	0.578	*p*-value = 0.875	
H10	Up to 24 (Group 1)	0.597	Group 1 - Group 2: –1.197	H10$_a$ not accepted
(Age)	Between 24 and 34 (Group 2)	0.485	Group 1 - Group 3: 1.302	
	Above 34 (Group 3)	0.643	Group 2 - Group 3: 2.034	
			p-value = 0.127	

H11	Less than $ 6,500 (Group 1)	0.507	Group 1 - Group 2: 0.265	H11$_a$ not accepted
(Annual	Between $ 6,500 and $ 13,000 (Group 2)	0.609	Group 1 - Group 3: 0.282	
Income)	Above $ 13,000 (Group 3)	0.641	Group 2 - Group 3: 0.023	
			p-value: 0.950	
H12	Less than $ 130 (Group 1)	0.634	Group 1 - Group 2: – 2.880	H12$_a$ accepted*
(Monthly			Group 1 - Group 3: – 0.075	
Spending on	Between $ 130 and $ 260 (Group 2)	0.359	Group 2 - Group 3: 2.186	
Online shopping)	Above $ 260 (Group 3)	0.610	p-value: 0.014	
H13	Less than 3 (Group 1)	0.586	Group 1 - Group 2: 0.005	H13$_a$ not accepted
(Number of Sites	Between 3 and 5 (Group 2)	0.570	Group 1 - Group 3: 1.544	
Used for Online	Above 5 (Group 3)	0.631	Group 2 - Group 3: 1.549	
Shopping)			p-value: 0.268	
H14	Less than 3 (Group 1)	0.560	Group 1 - Group 2: – 0.021	H14$_a$ not accepted
(Frequency of	Between 3 and 5 (Group 2)	0.611	Group 1 - Group 3: 0.452	
Online Shopping)	Above 5 (Group 3)	0.596	Group 2 - Group 3: 0.444	
			p-value: 0.892	

Note. *p < 0.05.

Except for "monthly spending on online shopping," we did not find the moderating effects of any other factors between the linkage of OP and OSCA to be significant. Overall, the non-support of these hypotheses provides valuable insights into the complexity of online shopping behavior and the need for further exploration and refinement of theoretical models by considering the specific characteristics of the study population, cultural factors, and the evolving nature of the online shopping environment in understanding consumer behavior.

Discussion and Conclusion

The e-commerce industry is changing rapidly. A recent India-based study (Agarwal et al., 2021) shed light on small-town customers' intricate online buying patterns, which are very different from those of consumers in major cities. According to the study (Chincholkar & Sonwaney, 2022), consumers in tier-III towns in India are engaged in online purchasing, with mobile phones and related accessories and apparel and accessories being the most favored segments. Another study (Roy & Mandal, 2021) revealed that economic price-searching behavior (EPSB) was significantly related to age, income, and brand loyalty. Consumers were apprehensive about the accuracy of information in a study (Malik & Dangi, 2021) focusing on information search behavior. According to one study, customer pleasure partially mediates e-service quality attributes and customer loyalty (Mahadevan & Joshi, 2022). Two studies (Kar et al., 2022; Kar & Das, 2022) exploring product returns in online purchases stated that switching physical operations to online poses an extra challenge. Our research supports the recent study (Armağan & Ünal, 2022) on the role of e-procrastination in OSCA. The findings of this study have important implications for managers, marketers, and other practitioners in the e-commerce industry, as discussed below.

Managerial Implications

Customers who procrastinate when making decisions are less likely to purchase impulse when provided with planning cues (Upadhye et al., 2021). According to a study (Mishra et al., 2021), if consumers experience higher

cognitive conflict due to extensive online searches and comparisons during their shopping experience, they are more likely to abandon their shopping carts. Our research has shed light on interventions and strategies to reduce OSCA.

By uncovering the potential link between online shopping procrastination and cart abandonment, this research paper offers valuable insights to online retailers and marketers. Understanding the psychological mechanisms underlying cart abandonment can inform the development of effective strategies to mitigate this issue and improve conversion rates. This study shows that OA has a significant positive relationship with online shopping cart abandonment ($\beta = 0.57$, Adjusted R-Square $= 0.33$). OP is reflected through ODP (maximizing the likelihood of having the best deal) and OR (voluntarily delaying the purchase to get more information, comparing websites and shops, and searching for additional information). Marketers can utilize this information to develop marketing strategies to reduce online procrastination, which may help lower online shopping cart abandonment. The study will help e-commerce firms understand the customers better concerning their income segment, online shopping time, and the number of sites visited in the context of their shopping cart abandonment. The results affirmed mean level differences for OP and OSCA across annual income groups, number of sites used for online shopping, and frequency. In addition, the multi-group analysis reveals that monthly spending levels for online shopping moderate the relationship between OP and OSCA. Customer psychographic variables such as monthly spending levels can be used to segment and target consumers to decrease online shopping cart abandonment behavior. Marketers may apply tailor-made promotions to target different consumers based on income segments, time spent on e-shopping, etc. The following are the critical managerial implications based on the previous research outcomes:

Implementing Effective Communication

To decrease the number of abandoned carts, a fast checkout process and special deals for quick purchases, like "10% off if ordered within two minutes," can be helpful (Rejikumar & Asokan-Ajitha, 2021). However, if advertising methods hinder the connection between consumers and marketers, it could increase the likelihood of perceived ad crowding, ultimately resulting in consumers abandoning their shopping carts (Khan et al., 2022).

Enhancing User Experience

On product webpages, including advocacy banners that show "most purchased" or "others also bought" can lead customers to reconsider or replace products they previously abandoned on the checkout page with similar ones (Yeh & Kuo, 2019). An e-cart should have four key features: an order summary page, a delivery progress bar, a live chat feature, and a way to validate purchase history (Paul et al., 2020) to reduce shopping cart abandonment. In addition, websites offering a simple and efficient shopping experience can significantly reduce customers abandoning their shopping carts (Kwon et al., 2020). E-commerce companies can improve customer experience by trying different shopping cart sorting options (clustering, time, promotions, type, etc.) and analyzing which are most effective for customer satisfaction (Jiang et al., 2021). Online retailers should establish a maximum limit on the number of items customers can add to their online shopping carts to reduce shopping cart abandonment (Zhao et al., 2021).

Addressing Customer Hesitancy

It is critical to design optimization strategies to solve the issue of reluctance during checkout to avoid shoppers abandoning their shopping carts (Wang et al., 2023). According to a conjoint study for optimizing e-commerce

websites, the most important feature is the "call to action phrase," followed by "product information," "search option availability," and "product page display," in that order (Das et al., 2022).

Theoretical Implications

Theoretical implications arise from integrating the S-O-R theory and exploring the internal cognitive processes underlying online shopping procrastination and cart abandonment. The study refreshes the existing literature by examining the relationship between online shopping procrastination and shopping cart abandonment, which has received limited attention in previous research. By identifying and exploring the internal cognitive process of procrastination as a contributing factor to cart abandonment, our study enhances the understanding of consumer decision-making in online shopping.

In terms of scale and measurement, we modified the established scales for measuring OP and OSCA, previously validated and widely used in the literature. In addition, the reliability values of these scales were within acceptable ranges, ensuring the robustness of the measurement instrument used in our study. The B-C-D-E framework provides a comprehensive perspective on the stages of online shopping abandonment, enabling researchers and practitioners to analyze and address each stage separately. Strategies can be developed to mitigate abandonment rates and improve the overall online shopping experience by understanding the factors influencing abandonment at each stage. This framework serves as a valuable tool for identifying and prioritizing interventions to optimize conversion rates and enhance customer satisfaction in e-commerce.

Limitations of the Study and Scope for Future Research

The study has a few limitations. First, only one independent variable (OP) is considered. Future research must expand the current investigation by including additional variables established through previous studies. This will help move closer to a complete theoretical framework for OSCA. Second, the study was conducted with online shoppers from two countries. Future studies need to include additional countries and cultural contexts. Third, other moderators, such as devices used for online shopping and the purchased category, can be used to study the moderation effects. Finally, our study focused on individual-level factors and did not extensively consider the role of situational and contextual variables. Future studies could explore the impact of website design, trust factors, and pricing strategies on online shopping procrastination and cart abandonment to provide a more holistic understanding.

Authors' Contribution

Piyusa Das conceived the idea and developed the quantitative design for the empirical study. Bhuwandeep conducted the Literature Review, verified the analytical methods, and helped collect data. The numerical computations were done by Piyusa Das using SPSS 25.0 and AMOS 23.0, and he wrote the draft paper. Finally, Bhuwandeep edited the manuscript in consultation with the first author.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

Funding Acknowledgment

References

Agarwal, A., Chahar, B., & Bhati, N. S. (2021). Online impulse buying behaviour of Indian small town consumers : Scale development and validation. *Indian Journal of Marketing, 51*(5–7), 48–63. https://doi.org/10.17010/ijom/2021/v51/i5-7/161647

Aguinis, H., Gottfredson, R. K., & Joo, H. (2013). Best-practice recommendations for defining, identifying, and handling outliers. *Organizational Research Methods, 16*(2), 270–301. https://doi.org/10.1177/1094428112470848

Albrecht, C.-M., Hattula, S., & Lehmann, D. R. (2017). The relationship between consumer shopping stress and purchase abandonment in task-oriented and recreation-oriented consumers. *Journal of the Academy of Marketing Science, 45*(5), 720–740. https://doi.org/10.1007/s11747-016-0514-5

Armağan, C., & Ünal, S. (2022). Investigation of online shopping cart abandonment on the perspective of e-procrastination behavior. *International Journal of Marketing, Communication and New Media, 10*(19), 66–89. https://doi.org/10.54663/2182-9306.2022.v10.n19.66-89

Arora, N., Aggarwal, A., & Gupta, S. (2016). Purchase habits on the Internet by gender: A literature review. *Pacific Business Review International, 8*(10), 78–86.

Azimi, S., Milne, G. R., & Miller, E. G. (2020). Why do consumers procrastinate and what happens next? *Journal of Consumer Marketing, 37*(7), 795–805. https://doi.org/10.1108/JCM-07-2019-3329

Baymard Institute. (2019). *41 cart abandonment rate statistics*. https://baymard.com/lists/cart-abandonment-rate

Benson, L. G., & Ndoro, T.T.R. (2022). An investigation into online shopping cart abandonment in South Africa. *International Review of Management and Marketing, 12*(3), 26–30. https://doi.org/10.32479/irmm.12985

Chincholkar, S., & Sonwaney, V. (2022). How demographic factors impact consumers' product choice during online shopping : An empirical study of Tier-III markets. *Indian Journal of Marketing, 52*(2), 34–52. https://doi.org/10.17010/ijom/2022/v52/i2/168153

Cho, C.-H., Kang, J., & Cheon, H. J. (2006). Online shopping hesitation. *CyberPsychology & Behavior, 9*(3), 261–274. https://doi.org/10.1089/cpb.2006.9.261

Cho, J. (2004). Likelihood to abort an online transaction: Influences from cognitive evaluations, attitudes, and behavioral variables. *Information & Management, 41*(7), 827–838. https://doi.org/10.1016/j.im.2003.08.013

Chun Chu, A. H., & Choi, J. N. (2005). Rethinking procrastination: Positive effects of "active" procrastination behavior on attitudes and performance. *The Journal of Social Psychology, 145*(3), 245–264. https://doi.org/10.3200/SOCP.145.3.245-264

Close, A. G., & Kukar-Kinney, M. (2010). Beyond buying: Motivations behind consumers' online shopping cart use. *Journal of Business Research, 63*(9–10), 986–992. https://doi.org/10.1016/j.jbusres.2009.01.022

Cook, R. D. (1977). Detection of influential observations in linear regression. *Technometrics, 19*(1), 15–18. https://doi.org/10.2307/1268249

Corkin, D. M., Yu, S. L., & Lindt, S. F. (2011). Comparing active delay and procrastination from a self-regulated learning perspective. *Learning and Individual Differences, 21*(5), 602–606. https://doi.org/10.1016/j.lindif.2011.07.005

Curran, P. G. (2016). Methods for the detection of carelessly invalid responses in survey data. *Journal of Experimental Social Psychology, 66,* 4–19. https://doi.org/10.1016/j.jesp.2015.07.006

Darpy, D. (2000). Consumer procrastination and purchase delay. In, *29th Annual Conference EMAC.* https://hal.science/hal-01517108/document

Das, P., Kar, B., & Misra, S. N. (2022). Information processing style and e-commerce website design: A clustering-based conjoint approach. *Journal of Humanities and Social Sciences Research, 4*(S), 63–74. https://doi.org/10.37534/bp.jhssr.2022.v4.nS.id1191.p63

De Silva, G. H. B. A., & Wijayanayake, W. M. J. I. (2015). E-cart abandonment behaviour : The moderating effect of trust. *Sri Lanka Journal of Management*, *20*(3&4), 52–69.

Egeln, L. S., & Joseph, J. A. (2012). Shopping cart abandonment in online shopping. *Atlantic Marketing Journal, 1*(1), 1–14. https://digitalcommons.kennesaw.edu/amj/vol1/iss1/1

Erdil, M. (2018). Factors affecting shopping cart abandonment: Pre-decisional conflict as a mediator. *Journal of Management, Marketing and Logistic, 5*(2), 140–152. https://doi.org/10.17261/pressacademia.2018.845

Ferrari, J. R. (1994). Dysfunctional procrastination and its relationship with self-esteem, interpersonal dependency, and self-defeating behaviors. *Personality and Individual Differences, 17*(5), 673–679. https://doi.org/10.1016/0191-8869(94)90140-6

Fox, S. (2023, June 6) *Online shopping statistics & trends in 2023.* https://www.cloudwards.net/online-shopping-statistics/

Hair, J. F., Black, W., Babin, B. J., & Anderson, R. E. (2019). Structural equation modeling: An introduction. In, *Multivariate data analysis* (pp. 642–643). Cengage.

Harman, D. (1967). A single factor test of common method variance. *Journal of Psychology, 35,* 359–378.

Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modelling : Guidelines for determining model fit. *Journal of Business Research Methods, 6*(1), 53–60.

Huang, G.-H., Korfiatis, N., & Chang, C.-T. (2018). Mobile shopping cart abandonment: The roles of conflicts, ambivalence, and hesitation. *Journal of Business Research, 85,* 165–174. https://doi.org/10.1016/j.jbusres.2017.12.008

Irmak, C., Kramer, T., & Sen, S. (2017). Choice under incomplete information on incumbents: Why consumers with stronger preferences are more likely to abandon their prior choices. *Journal of Consumer Psychology, 27*(2), 264–269. https://doi.org/10.1016/j.jcps.2016.06.002

Jiang, D., Zhang, G., & Wang, L. (2021). Empty the shopping cart? The effect of shopping cart item sorting on online shopping cart abandonment behavior. *Journal of Theoretical and Applied Electronic Commerce Research, 16*(6), 1973–1996. https://doi.org/10.3390/jtaer16060111

Kar, B., & Das, P. P. (2022). Impact of sector and region on survival and closure. *Indian Journal of Finance, 16*(2), 8–23. https://doi.org/10.17010/ijf/2022/v16i2/160397

Kar, B., Tripathy, A., & Pathak, M. D. (2022). What causes product returns in online purchases? A review and research agenda. *Prabandhan: Indian Journal of Management, 15*(4), 46–62. https://doi.org/10.17010/pijom/2022/v15i4/162837

Kemp, S. (2019, January 31). *Digital 2019: India.* https://datareportal.com/reports/digital-2019-india

Kemp, S. (2020, February 17). *Digital 2020: Ethiopia.* https://datareportal.com/reports/digital-2020-ethiopia

Khan, A., Rezaei, S., & Valaei, N. (2022). Social commerce advertising avoidance and shopping cart abandonment: A fs/QCA analysis of German consumers. *Journal of Retailing and Consumer Services, 67,* 102976. https://doi.org/10.1016/j.jretconser.2022.102976

Kukar-Kinney, M., & Close, A. G. (2010). The determinants of consumers' online shopping cart abandonment. *Journal of the Academy of Marketing Science, 38*(2), 240–250. https://doi.org/10.1007/s11747-009-0141-5

Kukar-Kinney, M., & Timothy, K. B. (2012). Toward a theory of consumer electronic shopping cart behavior: Motivations of e-cart use and abandonment. In, A. G. Close (ed.), *Online consumer behavior: Theory and research in social media, advertising, and e-tail* (pp. 323–344). Routledge.

Kwon, K. W., Bock, G.-W., & Hwang, K. M. (2020). The effect of personalization on cross-buying and shopping cart abandonment based on the S-O-R framework. *Asia Pacific Journal of Information Systems, 30*(2), 252–283. https://doi.org/10.14329/apjis.2020.30.2.252

Mahadevan, K., & Joshi, S. (2022). Impact of e-service quality dimensions on customer satisfaction and loyalty in online apparel shopping in India. *Indian Journal of Marketing, 52*(12), 20–38. https://doi.org/10.17010/ijom/2022/v52/i12/172560

Malik, A., & Dangi, H. K. (2021). A qualitative inquiry on information search behaviour for services in India. *Indian Journal of Marketing, 51*(3), 8–20. https://doi.org/10.17010/ijom/2021/v51/i3/158059

Manne, S., Chin, B., & Reinhardt, S. K. (2017). If you build it, will they come? *IEEE Micro*, *37*(6), 6–12. https://doi.org/10.1109/MM.2017.4241342

Matsunaga, M. (2010). How to factor-analyze your data right: Do's, don'ts, and how-to's. *International Journal of Psychological Research, 3*(1), 97–110. https://www.ders.es/Dialnet-HowToFactoranalyzeYourDataRight-3296455.pdf

Mishra, S., Malhotra, G., & Tiwari, S. R. (2021). Moderating effect of cognitive conflict on the relationship between value consciousness and online shopping cart abandonment. *The International Review of Retail, Distribution and Consumer Research, 31*(5), 511–530. https://doi.org/10.1080/09593969.2021.2002386

Mittal, B. (2022). Online shopping cart abandonment: A critique and guide to measuring its drivers. *The International Review of Retail, Distribution and Consumer Research, 32*(5), 568–588. https://doi.org/10.1080/09593969.2022.2126874

Negra, A., & Nabil Mzoughi, M. (2012). How wise are online procrastinators? A scale development. *Internet Research, 22*(4), 426–442. https://doi.org/10.1108/10662241211250971

Negra, A., Mzoughi, N., & Bouhlel, O. (2008). E-procrastination: A netnographic approach. *Journal of Customer Behaviour, 7*(2), 103–119. https://doi.org/10.1362/147539208x325894

Ogonowski, P. (2020, January 2). *10 ecommerce average order value statistics (Updated 2020).* https://www.growcode.com/blog/average-order-value/

Ong, A. K. S., Dejucos, M. J. R., Rivera, M. A. F., Muñoz, J. V. D. J., Obed, M. S., & Robas, K. P. E. (2022). Utilizing SEM-RFC to predict factors affecting online shopping cart abandonment during the COVID-19 pandemic. *Heliyon, 8*(11), E11293. https://doi.org/10.1016/j.heliyon.2022.e11293

Pappas, I. O., Kourouthanassis, P. E., Giannakos, M. N., & Chrissikopoulos, V. (2016). Explaining online shopping behavior with fsQCA: The role of cognitive and affective perceptions. *Journal of Business Research, 69*(2), 794–803. https://doi.org/10.1016/j.jbusres.2015.07.010

Paul, G. A., Harsha, K., & Rejikumar, G. (2020). E-cart design for controlling cart abandonment in e-commerce: A conjoint experiment. *International Journal of Recent Technology and Engineering (IJRTE), 8*(6), 3698–3703. https://doi.org/10.35940/ijrte.f9137.038620

Rajamma, R. K., Paswan, A. K., & Hossain, M. M. (2009). Why do shoppers abandon shopping cart? Perceived waiting time, risk, and transaction inconvenience. *Journal of Product & Brand Management, 18*(3), 188–197. https://doi.org/10.1108/10610420910957816

Rausch, T. M., & Brand, B. M. (2022). Gotta buy 'em all? Online shopping cart abandonment among new and existing customers. *International Journal of Electronic Business, 17*(2), 109–134. https://doi.org/10.1504/ijeb.2022.121913

Rausch, T. M., Derra, N. D., & Wolf, L. (2022). Predicting online shopping cart abandonment with machine learning approaches. *International Journal of Market Research, 64*(1), 89–112. https://doi.org/10.1177/1470785320972526

Rejikumar, G., & Asokan-Ajitha, A. (2021). Role of impulsiveness in online purchase completion intentions: An empirical study among Indian customers. *Journal of Indian Business Research, 13*(2), 189–222. https://doi.org/10.1108/JIBR-04-2018-0132

Rochanapon, P., Stankovic, M., Barber, M., Sung, B., & Lee, S. (2021). Abandonment issues: Why consumers abandon online shopping carts. In, P. Thaichon & V. Ratten (Eds.), *Developing digital marketing* (pp. 19–39). Emerald Publishing Limited. https://doi.org/10.1108/978-1-80071-348-220211002

Rodrigues, M. A., Proença, J., & Soares, I. (2022). The influence of perceived risk on mobile shopping cart abandonment. *Journal of Strategic Marketing, 1*–18. https://doi.org/10.1080/0965254X.2022.2160480

Roy, S., & Mandal, K. (2021). Economic price searching, quality seeking, value deriving behavior of women and their relationship with demographics and loyalty : An empirical study. *Indian Journal of Marketing, 51*(5–7), 32–47. https://doi.org/10.17010/ijom/2021/v51/i5-7/161645

Rubin, D., Martins, C., Ilyuk, V., & Hildebrand, D. (2020). Online shopping cart abandonment: A consumer mindset perspective. *Journal of Consumer Marketing, 37*(5), 487–499. https://doi.org/10.1108/JCM-01-2018-2510

Serrano, S. (2020). *Complete list of cart abandonment statistics: 2006–2020.* https://www.barilliance.com/cart-abandonment-rate-statistics/#tab-con-8

Sharma, S., Mukherjee, S., Kumar, A., & Dillon, W. R. (2005). A simulation study to investigate the use of cutoff values for assessing model fit in covariance structure models. *Journal of Business Research, 58*(7), 935–943. https://doi.org/10.1016/j.jbusres.2003.10.007

Sondhi, N. (2017). Segmenting & profiling the deflecting customer: Understanding shopping cart abandonment. *Procedia Computer Science, 122,* 392–399. https://doi.org/10.1016/j.procs.2017.11.385

Song, J.-D. (2019). A study on online shopping cart abandonment: A product category perspective. *Journal of Internet Commerce, 18*(4), 337–368. https://doi.org/10.1080/15332861.2019.1641782

Steel, P. (2007). The nature of procrastination. *Psychological Bulletin, 133*(1), 65–94. https://doi.org/10.11575/PRISM/34061

Svartdal, F., Pfuhl, G., Nordby, K., Foschi, G., Klingsieck, K. B., Rozental, A., Carlbring, P., Lindblom-Ylänne, S., & Rebkowska, K. (2016). On the measurement of procrastination: Comparing two scales in six European countries. *Frontiers in Psychology*, *7*, 1307. https://doi.org/10.3389/fpsyg.2016.01307

Taheer, F. (2023, January 18). *Online shopping statistics you need to know in 2023.* OptionMonster. https://optinmonster.com/online-shopping-statistics/#:~:text=So

Upadhye, B., Sivakumaran, B., Pradhan, D., & Lyngdoh, T. (2021). Can planning prompt be a boon for impulsive customers? Moderating roles of product category and decisional procrastination. *Psychology & Marketing, 38*(8), 1197–1219. https://doi.org/10.1002/mar.21490

Wang, S., Cheah, J.-H., & Lim, X.-J. (2023). Online shopping cart abandonment: A review and research agenda. *International Journal of Consumer Studies, 47*(2), 453–473. https://doi.org/10.1111/ijcs.12876

Wang, S., Ye, Y., Ning, B., Cheah, J.-H., & Lim, X.-J. (2022). Why do some consumers still prefer in-store shopping? An exploration of online shopping cart abandonment behavior. *Frontiers in Psychology, 12*, 1–14. https://doi.org/10.3389/fpsyg.2021.829696

Xu, Y., & Huang, J.-S. (2015). Factors influencing cart abandonment in the online shopping process. *Social Behavior and Personality: An International Journal, 43*(10), 1617–1627. https://doi.org/10.2224/sbp.2015.43.10.1617

Yeh, H., & Kuo, F. (2019). Effects of online advocacy banners on customers after abandoning products in online shopping carts. *Interdisciplinary Journal of Information, Knowledge, and Management, 14,* 165–181. https://doi.org/10.28945/4310

Zanjani, S. H. A., Milne, G. R., & Miller, E. G. (2016). Procrastinators' online experience and purchase behavior. *Journal of the Academy of Marketing Science, 44*(5), 568–585. https://doi.org/10.1007/s11747-015-0458-1

Zhao, H., Wang, X., & Jiang, L. (2021). To purchase or to remove? Online shopping cart warning pop-up messages can polarize liking and purchase intention. *Journal of Business Research, 132*, 813–836. https://doi.org/10.1016/j.jbusres.2020.10.067

Zhou, H. B., & Gao, J. T. (2014). Automatic method for determining cluster number based on silhouette coefficient. *Advanced Materials Research, 951*, 227–230. https://doi.org/10.4028/www.scientific.net/AMR.951.227

Zhou, M. (2020). Gender differences in procrastination: The role of personality traits. *Current Psychology, 39*(4), 1445–1453. https://doi.org/10.1007/s12144-018-9851-5

About the Authors

Prof. Piyusa Das has over 10 years of corporate experience and 5 years of academic and research experience. His research interests include the acceptance and influence of technology in marketing research and experimental designs for new product development. He graduated from IIM Lucknow.

Prof. Bhuwandeep is a management expert with over 8 years of experience in marketing, vendor management, and marketing analytics, and an ardent researcher interested in consumer psychology, marketing, and e-commerce. He attended IIT Kharagpur and IIM Bangalore.